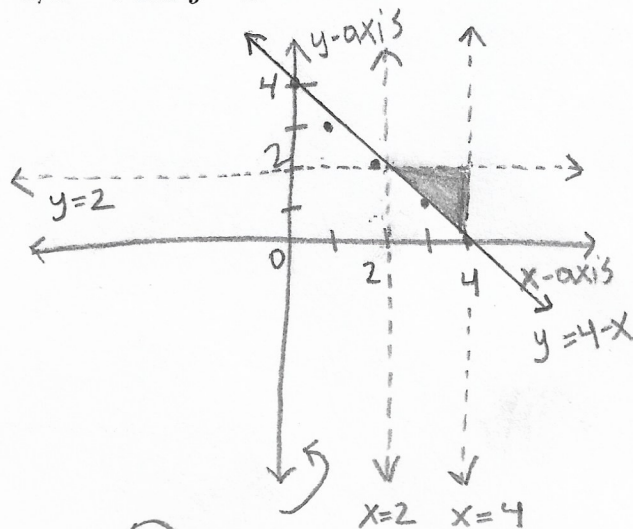


## Quiz 2

1. Sketch (shade in) the region  $R$  bounded by  $y = 4 - x$ ,  $x = 2$ ,  $x = 4$  and  $y = 2$ .



2. Find the volume of the solid obtained by rotating  $R$  around the  $y$ -axis.

$$V = \int \pi (f(y))^2$$

$$V = \pi \int_0^2 (4-x)^2 dy$$

$$V = \pi \int_0^2 (4-y)(4-y) dy$$

$$V = \pi \int_0^2 (16 - 4y - 4y + y^2) dy$$

$$V = \pi \int_0^2 (y^2 - 8y + 16) dy$$

$$V = \pi \left[ \frac{y^3}{3} - \frac{8y^2}{2} + 16y \right] \Big|_0^2$$

$$V = \pi \left[ \frac{y^3}{3} - 4y^2 + 16y \right] \Big|_0^2$$

$$V = \pi \left[ \frac{(2)^3}{3} - 4(2)^2 + 16(2) \right] - 0$$

$$V = \pi \left[ \frac{8}{3} - 16 + 32 \right] - 0$$

$$V = \pi \left[ \frac{8}{3} + 16 \right] - 0$$

$$R = f(y)$$

$$y = 4 - x$$

$$x = 4 - y$$

$$V = \pi \left[ \frac{8}{3} + \frac{48}{3} \right]$$

$$V = \frac{56\pi}{3} \text{ units}^3$$